IN THE CLAIMS:

1-11. (Canceled)

12. (Currently amended) A method for mapping a virtual address space into block addresses of at least one data storage device, the method comprising:

generating in a data processing system a hierarchical data structure in a primary storage;

wherein the hierarchical data structure includes a plurality of layers arranged according to a hierarchy;

wherein the plurality of layers include at least a highest layer and a lowest layer;

wherein each layer in the hierarchical data structure includes at least one set of data entries;

wherein each data entry in each layer represents a range of the virtual address space;

wherein for each layer in the hierarchical data structure for which there exists an next lowest layer, each data entry is correlated to a set of data entries in the next lowest layer according to a correlation scheme;

wherein each data entry in the lowest layer corresponds to both a virtual address range in the virtual address space and a block address corresponding to a physical data block in the at least one data storage device;

wherein each data entry contained within the primary storage corresponds to a virtual address range that is currently occupied with stored data, such that none of the data entries corresponds to only unused physical storage; [[and]]

wherein each physical data block in the at least one data storage device contains virtual address information that identifies at least one corresponding location in the virtual address space for that physical data block; and

wherein at least some of the data entries in each layer represent virtual address ranges of a homogeneous size corresponding to that layer.

13. (Previously presented) The method of claim 12, further comprising:

swapping sub-hierarchies of data entries between the hierarchical data structure in primary storage and a secondary storage.

14. (Previously presented) The method of claim 12, wherein at least some of the data entries in the lowest layer include a device address identifying an individual storage device in the at least one data storage device.

15. (Previously presented) The method of claim 12, wherein the correlation scheme is one of an algorithm, a hash algorithm, a pointer system, and a pointer to correlation logic.

16. (Canceled)

17. (Currently amended) The method of claim [[16]] 12, further comprising:

generating a second data structure, wherein the second data structure identifies exceptional data entries in the hierarchical data structure, wherein each individual exception data entry corresponds to a virtual address range a size that differs from the homogeneous size corresponding to that layer to which the individual exceptional data entry belongs.

18. (Currently amended) The method of claim [[16]] 12, wherein the virtual address information identifies a plurality of corresponding locations in the virtual address space for the physical data block.

19. (Currently amended) A computer program product in a computer-readable medium for mapping a virtual address space into block addresses of at least one data storage device, the computer program product comprising:

instructions for generating a hierarchical data structure in a primary storage;

wherein the hierarchical data structure includes a plurality of layers arranged according to a hierarchy;

wherein the plurality of layers include at least a highest layer and a lowest layer;

wherein each layer in the hierarchical data structure includes at least one set of data entries;

wherein each data entry in each layer represents a range of the virtual address space;

wherein for each layer in the hierarchical data structure for which there exists an next lowest layer, each data entry is correlated to a set of data entries in the next lowest layer according to a correlation scheme;

wherein each data entry in the lowest layer corresponds to both a virtual address range in the virtual address space and a block address corresponding to a physical data block in the at least one data storage device;

wherein each data entry contained within the primary storage corresponds to a virtual address range that is currently occupied with stored data, such that none of the data entries corresponds to only unused physical storage; [[and]]

wherein each physical data block in the at least one data storage device contains virtual address information that identifies at least one corresponding location in the virtual address space for that physical data block; and

wherein at least some of the data entries in each layer represent virtual address ranges of a homogeneous size corresponding to that layer.

20. (Previously presented) The computer program product of claim 19, further comprising:

instructions for swapping sub-hierarchies of data entries between the hierarchical data structure in primary storage and a secondary storage.

21. (Previously presented) The computer program product of claim 19, wherein at least some of the data entries in the lowest layer include a device address identifying an individual storage device in the at least one data storage device.

22. (Previously presented) The computer program product of claim 19, wherein the correlation scheme is one of an algorithm, a hash algorithm, a pointer system, and a pointer to correlation logic.

23. (Canceled)

24. (Currently amended) The computer program product of claim [[23]] 19, further comprising:

instructions for generating a second data structure, wherein the second data structure identifies exceptional data entries in the hierarchical data structure, wherein each individual exception data entry corresponds to a virtual address range a size that differs from the homogeneous size corresponding to that layer to which the individual exceptional data entry belongs.

25. (Previously presented) The computer program product of claim 19, wherein the virtual address information identifies a plurality of corresponding locations in the virtual address space for the physical data block.

26. (Currently amended) A data management system for mapping a virtual address space into block addresses of at least one data storage device, the data management system comprising:

means for generating a hierarchical data structure in a primary storage;

wherein the hierarchical data structure includes a plurality of layers arranged according to a hierarchy;

wherein the plurality of layers include at least a highest layer and a lowest layer;

wherein each layer in the hierarchical data structure includes at least one set of data entries;

wherein each data entry in each layer represents a range of the virtual address space;

wherein for each layer in the hierarchical data structure for which there exists an next lowest layer, each data entry is correlated to a set of data entries in the next lowest layer according to a correlation scheme;

wherein each data entry in the lowest layer corresponds to both a virtual address range in the virtual address space and a block address corresponding to a physical data block in the at least one data storage device;

wherein each data entry contained within the primary storage corresponds to a virtual address range that is currently occupied with stored data, such that none of the data entries corresponds to only unused physical storage; [[and]]

wherein each physical data block in the at least one data storage device contains virtual address information that identifies at least one corresponding location in the virtual address space for that physical data block; and

wherein at least some of the data entries in each layer represent virtual address ranges of a homogeneous size corresponding to that layer.

27. (Previously presented) The data management system of claim 26, further comprising:

means for swapping sub-hierarchies of data entries between the hierarchical data structure in primary storage and a secondary storage.

28. (Previously presented) The data management system of claim 26, wherein at least some of the data entries in the lowest layer include a device address identifying an individual storage device in the at least one data storage device.

29. (Canceled)

30. (Currently amended) The data management system of claim [[29]] 26, further comprising:

means for generating a second data structure, wherein the second data structure identifies exceptional data entries in the hierarchical data structure, wherein each individual exception data entry corresponds to a virtual address range a size that differs

from the homogeneous size corresponding to that layer to which the individual exceptional data entry belongs.

31. (Previously presented) The data management system of claim 26, wherein the virtual address information identifies a plurality of corresponding locations in the virtual address space for the physical data block.

32. (Currently amended) A method for mapping a virtual address space into block addresses of at least one data storage device, the method comprising:

generating in a data processing system a hierarchical mapping table in a primary storage subsystem;

wherein the hierarchical mapping table includes a plurality of layers arranged according to a hierarchy;

wherein the plurality of layers include at least a highest layer and a lowest layer;

wherein each layer in the hierarchical mapping table includes at least one set of data entries;

wherein each data entry in each layer represents a range within the hierarchical mapping tables;

wherein for each layer in the hierarchical data structure for which there exists an next lowest layer, each data entry is correlated to a set of data entries in the next lowest layer according to a virtual mapping scheme;

wherein each data entry in the lowest layer corresponds to both a mapping table address range in the hierarchical mapping tables and a block entry corresponding to a physical data block in the at least one data storage device;

wherein each data entry contained within a data storage subsystem corresponds to the mapping table address range that is currently occupied with stored data, such that none of the data entries corresponds to only unused physical storage; [[and]]

wherein each physical data block in the at least one data storage device contains virtual address information that identifies at least one corresponding location in the virtual address space for that physical data block; and

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wherein at least some of the data entries in each layer represent virtual address ranges of a homogeneous size corresponding to that layer.